Leidy, Robert

From: Leidy, Robert
Sent: Monday, December 15, 2014 8:51 AM
To: Julia Fonseca
Subject: RE: Huth thesis

Thanks Julia…very gracious of you!

From: Julia Fonseca [mailto:Julia.Fonseca@pima.gov]
Sent: Monday, December 15, 2014 7:34 AM
To: 'cgarrett@swca.com'; 'mpolm@swca.com'
Cc: Leidy, Robert
Subject: FW: Huth thesis

Hi, Chris and Melissa, I have a borrowed copy. You can scan whatever additional pages you want at our office—not far from yours--I don't have permission to loan it out.

Julia Fonseca
Environmental Planning Manager

Pima County Office of Sustainability and Conservation
201 N. Stone, 6th floor
Tucson, AZ 85701
(520) 724-6460
Julia.Fonseca@pima.gov

Sonoran Desert Conservation Plan
Lower Santa Cruz Living River Project

From: Leidy, Robert [mailto:Leidy.Robert@epa.gov]
Sent: Thursday, December 11, 2014 10:03 AM
To: Julia Fonseca
Cc: Chris Garrett
Subject: FW: Huth thesis

Hi Julia,

See below. Could you please forward a complete copy to Chris and Melissa if you have it. If not, any leads on finding it? Prohaps you have contact information from Mr. Huth?

Thanks!

Rob

Robert A. Leidy, Ph.D.
U.S. Environmental Protection Agency
Wetlands Office (WTR-8)
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3463

From: Chris Garrett [mailto:cgarrett@swca.com]
Sent: Thursday, December 11, 2014 8:52 AM
To: Leidy, Robert
Cc: Melissa Polm; Vogel, Mindy S -FS
Subject: RE: Empire Gulch and upper Cienega Creek

Hi Rob –

As you can see from the email chain, the thesis from Hans Huth was forwarded to us to consider as we process things for the upcoming SBA analysis.

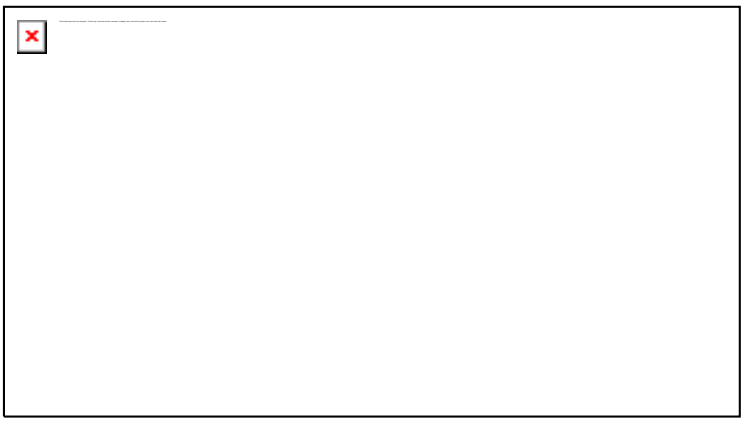
Unfortunately, the copy forwarded only appears to have excerpts of certain pages. We can't evaluate and use a partial copy. I checked with U of A yesterday and they do not have a copy of this thesis in their repository.

Can you forward the entire thesis to us?

Thanks for the help

- Chris

From: Vogel, Mindy S -FS [mailto:msvogel@fs.fed.us]
Sent: Tuesday, December 09, 2014 10:30 AM
To: Chris Garrett
Cc: Victoria Boyne
Subject: FW: Empire Gulch and upper Cienega Creek



From: Leidy, Robert [mailto:Leidy.Robert@epa.gov]
Sent: Monday, December 08, 2014 9:41 AM
To: Upchurch, Jim -FS; Vogel, Mindy S -FS; Calhoun, Jean; Ruyle, Jennifer -FS
Subject: FW: Empire Gulch and upper Cienega Creek

From: Julia Fonseca [mailto:Julia.Fonseca@pima.gov]
Sent: Monday, December 08, 2014 8:28 AM
To: 'Douglas, Jason (jason_douglas@fws.gov)'; 'Jeff Simms'; 'blomeli@blm.gov'; 'saleake@usgs.com'; Leidy, Robert
Subject: Empire Gulch and upper Cienega Creek

Hi, the attached thesis is relevant to the ongoing investigations relating to Empire Gulch and Upper Cienega Creek:

Using historical and new water quality data, the author modeled the chemical evolution of groundwater along the Oak Tree, Empire and Gardner Canyon flow paths to Cienega Creek.

"Spatially, the evidence points to evolution from a calcium-bicarbonate water type at the mountain front to a sodium-bicarbonate type in the central basin….[P]erennial flows likely represent mixing of more than two flowpaths. Not only is the connection between groundwaters and perennial flows supported, but the evolution of source waters from the same mountain front is suggested. This has important management implications since pumping near the mountain front may adversely affect the (source of) baseflow for Cienega Creek."

"..the high chloride concentration (0.24 mmol/l) in Cienega Creek perennial flows is consistent with chloride content of most shallow well analyses (Appendix 5). This further supports the hypothesis that the shallow aquifer is hydraulically connected to Cienega Creek, and that baseflow has its origin [in] mountain front recharge. It must be emphasized that this conclusion does not exclude a hydrologic connection between Cienega Creek and the deeper aquifer. The lack of a regional confining clay strata suggests that the shallow aquifer is connected to the deeper aquifer. Thus pumping from the latter could affect Cienega Creek baseflow directly."

I attached portions of the thesis that I copied and scanned. Citation: Huth, Hans. 1996. Hydrogeochemical Modeling of western mountain front recharge, upper Cienega Creek Sub-basin, Pima County, Arizona. MS thesis, University of Arizona Dept. of Hydrology and Water Resources.

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